

Remarks/Arguments

Applicants thank Examiner Brewster for his prompt and careful examination of this application and clear explanation of the claim rejections. In response, applicants amend claim 1 to overcome the rejection; cancel claims 8-23; and insert new claims 24-27.

Claim 1

Claim 1 describes a method for treating an area of a semiconductor wafer surface. The added limitation requires the method to include the step of tracing the scribe streets on a surface of the wafer with a laser to form a grid-like pattern matching the scribe streets; and wherein the traced area is melted by a laser beam and re-solidifies into a more planar profile. This limitation is not disclosed in either the Noguchi patent (US 4,731,516) or the Diaz publication (US 2003/0104679 A1), or suggested, motivated in their combination.

As explained in an earlier response to the Office Action of April 6, 2005, the Dias publication discloses a microelectronic device that has a beveled sidewall, and which is not melted by a laser beam and resolidifies into a more planar profile.

On the other hand, the Noguchi patent discloses a method to "mirror-polish" the rough ground rear surface of a semiconductor wafer with a focused laser beam but it does not disclose tracing the scribe streets to form a grid-like pattern because, as explained in the BACKGROUND section of the Noguchi patent, the invention is for polishing the ground surface so that a film of metal can be formed on it by vapor deposition.¹

It is well known in the art of semiconductor wafer processing that back side metallization by vapor deposition forms a substantially uniform metal film on the entire back side of a wafer. Because the entire back side is to be metallized, the entire back side needs to be "polished". Therefore, to form a grid-like pattern would render the Noguchi patent non-functional for its intended purpose.

Furthermore, the Noguchi patent cannot be combined with the Dias publication because the Noguchi patent teaches "mirror-polishing" the rear surface of a wafer while the Diaz

¹ See, US 4,731,516, col. 1, ll. 14-17.

publication teaches forming a substantially V-shaped notch extending into the wafer from the back surface. To combine the two references would render both methods inoperable.

Because the Noguchi patent, by itself or in combination with the Diaz publication, does not disclose all the elements in claim 1 of this application, applicants respectfully submit that claim 1 stands patentable over the Noguchi patent.

Claim 2

Claim 2 requires the treated area be ablated by the laser beam, vaporizing at least a portion of the surface irregularities. This element is not disclosed in cited passage of the Noguchi patent as suggested in the Office Action:

Experimental results have established that a mirror-polished rear surface is obtained when the ground rear surface has roughness ridges of approximately 1 μm in depth and the wafer surface is heated and fused or melted by a laser beam of about 20 Watts power, 50 μm in width, and scanning or moving at about 1 cm/second. When these laser heating, localized melting parameters are implemented with the semiconductor wafer preheated to approximately 200°-400° C. in an inert atmosphere, a rear wafer surface having an extreme or mirror smoothness results.²

Noguchi discloses heating and fusing or melting approximately 1 μm of the rear surface by a laser beam, it does not disclose ablating by the laser beam and vaporizing at least a portion of the surface irregularities. Therefore, applicants respectfully submit that claim 2 stands patentable over the Noguchi patent.

Claims 3-7

Claims 3-7 properly depend on claim 1 and therefore stand patentable at least by virtue of their dependence.

Claims 24-27

The newly inserted claims 24-27 are fully supported in the original specification and in the original drawing figures. They properly depend on claim 1 and therefore stand patentable at least by virtue of their dependence.

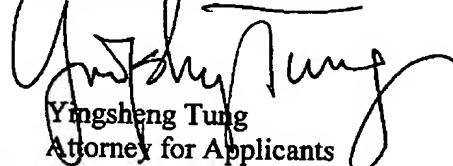
In summary, applicants respectfully submit that this application is in allowable form and claims 1-7 and 24-27 distinguish over the cited references and stand patentable.

² Ibid., col. 2, ll. 25-36.

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Applicants respectfully request further examination of this application and timely allowance of all pending claims.

Respectfully submitted,


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